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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/785,759 | 02/16/2001 | Ranjit Ghpurey | TI-31261 | 2970 |
| 23494 | 7590 | 04/05/2006 | EXAMINER | |
| TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265 | | | YUN, EUGENE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2618 | |
| DATE MAILED: 04/05/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/785,759 | GHARPUREY, RANJIT | |
| | Examiner | Art Unit | |
| | Eugene Yun | 2618 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 January 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 and 3-14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 26 March 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/19/2006 has been entered.

Claim Objections

2. Claim 13 is objected to because of the following informalities: Claim 13 currently depends on claim 2 1 which does not exist. In the current office action, the examiner will assume that the claim depends on claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishige et al. (US 6,600,911) in view of Rebeiz et al. (US 6,348,830 "IDS").

Referring to Claim 1, Morishige teaches a frequency division duplexed (FDD) radio (see col. 3, lines 53-67 noting that the general definition of a FDD radio is a radio which transmits at a different frequency than it receives a signal), comprising:

a duplexer 17 (fig. 2);

a transmitter section 22 (fig. 2) coupled to the duplexer, the transmitter section transmitting in a transmit frequency band having a center frequency; and

a receiver section 21 (fig. 2) coupled to the transmitter section, for receiving a signal at a receive frequency that is different from the transmit band center frequency (see col. 3, lines 53-67 noting that the difference is 1/2) the receiver section including a first down conversion section 4 (fig. 2) comprising first and second mixers (see the two mixers inside 4 of fig. 2).

Morishige does not teach mixers receiving a first local oscillator (LO) signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof. Rebeiz teaches mixers receiving a first local oscillator (LO) signal (fig. 11) having a frequency equal to the transmit band center frequency or a sub-harmonic thereof (see col. 7, lines 18-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Rebeiz to said method of Morishige in order to better reduce the interference in the radio.

Referring to Claim 8, Morishige teaches a method for minimizing the interference caused by the transmit signal produced by the transmit section 22 (fig. 2) of a frequency division duplexed (FDD) radio (see col. 3, lines 53-67 noting that the general definition

of a FDD radio is a radio which transmits at a different frequency than it receives a signal), in a transmit frequency band having a center frequency, on a signal at a receive frequency differing from the transmit band center frequency (see col. 3, lines 53-67 noting that the difference is 1/2) and received by the receiver section 21 (fig. 2) of the radio, the receiver section having a first down conversion section 4 (fig. 2), the method comprising the steps of:

providing a local oscillator (LO) signal 5 (fig. 2) to the first down conversion section of the receiver (see col. 7, lines 19-23); and

filtering the output of the first down conversion section of the receiver 6 (fig. 2 and col. 7, lines 14-19).

Morishige does not teach the LO signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof. Rebeiz teaches the LO signal having a frequency equal to the transmit band center frequency or a sub-harmonic thereof (see col. 7, lines 18-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Rebeiz to said method of Morishige in order to better reduce the interference in the radio.

5. Claims 3-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morishige and Rebeiz in view of Tolson et al. (US Patent App. 09/413,725).

Referring to Claim 3, the combination of Rebeiz and Morishige does not teach a first high pass filter coupled to the output of the first mixer and a second high pass filter coupled to the output of the second mixer. Tolson teaches a first high pass filter 10 (fig.

1) coupled to the output of the first mixer and a second high pass filter 11 (fig. 1) coupled to the output of the second mixer (see pg. 4, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Rebeiz in order to reduce the size of the radio while enhancing reliable operations.

Referring to Claim 9, the combination of Rebeiz and Morishige does not teach high pass filtering the output of the first down conversion section. Tolson teaches high pass filtering the output of the first down conversion section (see 10 and 11 of fig. 1 and pg. 4, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Rebeiz in order to reduce the size of the radio while enhancing reliable operations.

Referring to Claims 5 and 11, Tolson also teaches cascaded single pole high pass filters (fig. 1 and pg. 5, lines 20-24).

Referring to Claim 6, the combination of Morishige and Rebeiz does not teach the high pass filters having an output and a first set of two mixers coupled to the output of the first high pass filter and a second set of two mixers coupled to the output of the second high pass filter. Tolson teaches the high pass filters 10 and 11 (fig. 1) having an output and a first set of two mixers 6 (fig. 1) coupled to the output of the first high pass filter and a second set of two mixers 12 (fig. 1) coupled to the output of the second high pass filter (see pg. 6, lines 13-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of

Tolson to the modified device of Morishige and Rebeiz in order to better enhance the performance of the radio.

Referring to Claims 4 and 10, Morishige also teaches integrated DC blocking capacitors (see col. 11, lines 12-17).

Referring to Claim 7, Tolson also teaches a first mixer of the first set of two mixers providing an in-phase component at an output and a second mixer of the first set of two mixers providing a quadrature component at an output (fig. 1) and further comprising:

a first adder 5 (fig. 1) having a first input for receiving the output of the second mixer of the first set of two mixers, and a second input for receiving the output of the first mixer of the second set of two mixers, said first adder having an output for providing an in-phase component base band signal (see pg. 5, lines 5-12); and

a second adder 5 (fig. 1) having a first input for receiving the output of the first mixer of the first set of two mixers, and a second input for receiving the output of the second mixer of the second set of two mixers, said second adder having an output for providing a quadrature component base band signal (see pg. 5, lines 5-12).

Referring to Claim 12, Tolson also teaches down converting the high pass filtered output using a second down conversion section 21 (fig. 1 and pg. 5, lines 14-15).

Referring to Claim 13, Tolson also teaches a first high pass filter 10 (fig. 1) coupled to the output of the first mixer, for passing frequencies including an intermediate frequency corresponding to a difference between the center frequency of

the receiver section and the center frequency at which the transmitter section transmits (see pg. 4, lines 16-23); and

a second high pass filter 11 (fig. 1) coupled to the output of the second mixer, for passing frequencies including an intermediate frequency corresponding to a difference between the center frequency of the receiver section and the center frequency at which the transmitter section transmits (see pg. 4, lines 16-23).

Referring to Claim 14, Morishige teaches a method of operating a receiver 21 (fig. 2) in an FDD radio (see col. 3, lines 53-67 noting that the general definition of a FDD radio is a radio which transmits at a different frequency than it receives a signal) to remove, from a desired receive signal, interference caused by a transmitter 22 (fig. 2) transmitting at a transmit center frequency, the desired receive signal having a receive center frequency that is different from the transmit center frequency, comprising the steps of:

Mixing the receive signal with a local oscillator frequency 5 (fig. 2) to provide a down-converted receive signal 4 (fig. 2).

Morishige does not teach the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof. Rebeiz teaches the local oscillator frequency equal to the transmit center frequency of a sub-harmonic thereof (see col. 7, lines 18-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Rebeiz to said method of Morishige in order to better reduce the interference in the radio. The combination of Morishige and Rebeiz does not teach high pass filtering the down converted receive

signal and converting the high pas filtered down converted receive signal to a baseband signal. Tolson teaches high pass filtering the down converted receive signal (see 10 and 11 of fig. 1) and converting the high pas filtered down converted receive signal to a baseband signal (see col. 4, lines 27-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the teachings of Tolson to the modified device of Morishige and Rebeiz in order to better enhance the performance of the radio.

Response to Arguments

6. Applicant's arguments with respect to claims 1 and 3-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Yun whose telephone number is (571) 272-7860. The examiner can normally be reached on 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on (571)272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2682

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Eugene Yun
Examiner
Art Unit 2682

EY


Matthew D Anderson
SPE 2618